

## Spider XM7 Network Command Munition

### Executive Summary

- During FY07, the Spider program continued in the low-rate initial production phase of its acquisition program and completed a Force Development Test (FDT) and Initial Operational Test and Evaluation (IOT&E).
- DOT&E approved the IOT&E plan contingent on the Army's commitment to execute a Follow-On Test and Evaluation (FOT&E) prior to the full-rate production (FRP) decision.
- Previously identified hardware and software complexity problems continued to challenge the program in the IOT&E. Follow-on testing will validate fixes for problems revealed in the IOT&E and support the FRP decision in February 2009.
- FOT&E is required to fully assess Spider's operational effectiveness and suitability.
- The program timeline remains consistent with the landmine alternative timeline.

### System

- Spider is a landmine alternative that satisfies the anti-personnel munition requirements outlined in the 2004 National Landmine Policy. That policy directs the DoD to:
  - End use of all persistent landmines after 2010
  - Incorporate self-destructing and self-deactivating technologies to develop alternatives to current persistent landmines
- The Army intends to achieve an initial operational capability with Spider by 2010.
- A Spider munition field includes:
  - Up to 63 munition control units, each housing six miniature grenade launchers
  - A remote control station, allowing the Soldier to maintain "man-in-the-loop" control or allow the Soldier to direct the munitions to act autonomously (if authorized) in response to intruders



- A communications relay device or "repeater" for use in difficult terrain or at extended ranges
- Units can employ Spider in all environments and in all terrains.
- Spider incorporates self-destructing and self-deactivating technologies to reduce residual risks to non-combatants after hostilities cease.

### Mission

Maneuver or engineer units will employ Spider, by itself or in conjunction with other networked munition systems, to accomplish these missions:

- Force protection
- Battlefield shaping
- Early warning
- Delay enemy forces
- Attrite enemy forces

### Activity

- DOT&E approved the IOT&E test plan in December 2006. Approval was contingent on the Army's commitment to conduct an FOT&E prior to an FRP decision.
- The program completed a FDT at Fort Leonard Wood, Missouri, in February 2007 to validate Spider tactics, techniques, and procedures.
- The IOT&E occurred at Fort Hood, Texas, in March-April 2007.
- Both events included the live firing of Spider munitions. Additionally, the FDT included live firing of Claymore mines and non-lethal Modular Crowd Control Munitions (MCCMs) using the Spider Munition Adaptor Modules.

### Assessment

- The February 2006 Milestone C Test and Evaluation Master Plan provides an adequate strategy to address system issues and thoroughly test Spider prior to the FRP decision.
- The IOT&E revealed that battery power is a significant factor in system performance and that units will most likely use vehicles to assist in powering and controlling Spider munitions fields. The program should provide vehicle power options for the Spider Control Station and test those options in the FOT&E.
- The IOT&E also revealed that Spider software, hardware, and electronic manuals are too complex. The program should

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reduce system complexity, make the technical manuals more user-friendly, and test the fixes in the FOT&E.

- Jamming affects the unit's ability to control the Spider munitions field. Spider interoperability with friendly counter-Improvised Explosive Device (IED) jammers must be demonstrated.
- Army policy on reuse and reloading of Munition Control Units (MCU) after one or more Miniature Grenade Launchers have been fired must be reviewed. Current procedures which require MCU disposal after firing one grenade have significant operational impacts. The program manager is working with the Army Fuze Safety Review Board on a plan that will support reuse of MCUs post detonation prior to Spider fielding.
- The Program Office is making system changes and moving to a new production facility in West Virginia. These changes mean that the Spider system tested in the IOT&E may not be production representative and dictated the need for a FOT&E before the FRP decision.

- A Beyond Low-Rate Initial Production Report summarizing the results from both the IOT&E and FOT&E is required to adequately support an FRP decision in February 2009.
- The program has sufficient time to test and confirm all system fixes and achieve Initial Operational Capability by 2010 in order to comply with the 2004 National Landmine Policy. A capability gap will exist until the Army has sufficient stocks to replace all of their persistent mines.

## Recommendations

- Status of Previous Recommendations. The program has addressed all previous DOT&E recommendations.
- FY07 Recommendations. The Army should:
  1. Review and clarify the policy on reuse and reloading of MCUs after one or more grenades have been fired.
  2. Validate Spider interoperability with friendly counter-IED jammers.
  3. Address power and system complexity issues and test them in an FOT&E.
  4. Execute an FOT&E before the end of FY08. The FOT&E should validate fixes for problems revealed in the IOT&E and confirm the effectiveness and suitability of the Spider system.